CASE STUDY

Bisphosphonates (BPs) represent a class of drugs that are applied in the therapy of different pathological conditions related to bone. Their main role in bone metabolism is to inhibit the osteoclast function, so these drugs act as potent drugs in suppression of the bone resorption process.

In 2003, Marx described non-healing and painful exposure of jaw bones, following an intravenous administration of potent aminobisphosphonates in patients suffering from multiple myeloma and metastatic bone lesions.

Soon this adverse effect was named Bisphosphonate-Related Osteonecrosis of the Jaw (BRONJ), or drug-induced osteonecrosis of the jaw. According to AAOMS, the definition of BRONJ means:

1. Current or previous treatment with bisphosphonates
2. Exposed bone in the maxillofacial region that has persisted for more than 8 weeks
3. No history of radiation therapy to the jaws.

Case report
We present a 55-year-old female patient, who developed BRONJ of the right upper jaw following a teeth extraction (teeth 13 and 14). Due to her severe osteoporosis she was under bisphosphonate therapy (Alendronate 70 mg once “per os” weekly) for the last four years. She also suffered from a confirmed diagnosis of COPD (chronic obstructive pulmonary disease). Following the clinical examination, the exposed bone in the right maxilla could be clinically identified (Fig. 1). In order to treat BRONJ accordingly, there was a need to define the accurate stage of the disease, because the treatment approach highly depends on the determination of the stage. The orthopanoramic image, which was performed, could not clearly visualize any bone sequestration (Fig. 2).

Fig. 1 Exposed bone, right maxilla.

Fig. 2 Panoramic X-ray, no clear signs of bone sequestration in the right maxilla.
CASE STUDY

According to AAOMS classification of the disease, a sequestration of bone is a clinical sign for stage 3 of BRONJ and requires a surgical debridement – the removal of bone sequester. A misdiagnosed sequestration of bone could lead to wrong treatment planning and head in the progression of the disease.

In order to improve the preoperative stage and to perform an adequate treatment plan, a CBCT (SCANORA® 3Dx, SOREDEX) was acquired (Fig. 3 and 3a).

To visualize specific bone structures, a rendered view was made in the image editing software (OnDemand3D™, Cybermed), and it revealed the detailed information needed. By using the 3D zoom tool, it is very easy to eliminate other structures, which could interfere with the region of interest (ROI) (Fig. 5 and 5a).

The axial and sagittal views of the CBCT confirmed our findings (Fig. 4 and 4a).

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CASE STUDY

It was very important to avoid a superimposition of other bony structures. By acquiring a CBCT, as the sophisticated technology in radiologic diagnostics, we could exactly predict the stage of the bone sequestration in the right maxilla. According to the radiological findings we performed a surgical sequestrectomy (Fig. 6 and 6a).

![Fig. 6](https://example.com/fig6.jpg) Surgical sequestrectomy, right maxilla

![Fig. 6a](https://example.com/fig6a.jpg) Specimen, sequester.

The defect recovered completely within 10 days, showing no signs of a disease relapse in 6 months postoperatively.

**Conclusion**

BRONJ is a serious negative side effect of a bisphosphonate therapy that impacts negatively on the patients’ quality of life. It is painful, non-healing and often without any adequate response to the applied therapy.

Due to its versatility in imaging, resolution and the possibility to predict bony lesions with high accuracy, CBCT technology could be of great importance in the treatment of BRONJ patients in the future.

**References**
